The Builder.

VOL. XIII.—No. 660.

PERSONS now living, who can remember five or six and thirty years back, will perceive with pleasure that a great change for the better has taken place in the estimation of the fine arts as an aid to education; nevertheless, although this fact has become recognised, we are still, unfortunately, very deficient in adequate means for conveying art-instruction to the artizans and other useful classes in this country, which will enable them to take an equal position with those in similar circumstances in France and Germany.

In the higher walks of art we have produced Flaxman,—a sculptor who, for high and refined conceptions, and for correct execution, has not been surpassed in any country in modern times.

In painting we have the bold and manly works of Reynolds, which unite in many instances the depths of Rembrandt with the glowing colours of Titian; Gainsborough, with his playful and varied tints; the elegant and graceful Lawrence; Opie, Wilson, Turner (a landscape painter, who has never been equalled), and a number of others of the past generation, who have shown by their works that we are not an "unartistic people." Nor do the artists of the present day fail to prove that in England there exists the nucleus of a school of art, which only requires culture to achieve success in the highest path as well as in ornamental works. Our water-colour painters are unequalled; and the artists in other styles show that they are neither deficient in the appreciation of the beauties of colours, in the knowledge and distribution of light and shadow, nor in a true feeling for nature or pure sentiment: some of our living sculptors, too, deservedly rank amongst the first in Europe.

The great mine of English raw-material has, however, been heretofore comparatively unwrought. The masses have been untaught. It is not now denied that the study of art ought to be commenced with the earliest dawnings of sense. We do not mean that parrot kind of education, by which children are taught to jingle rhymes, or to say that twice twelve are twenty-four, three times twelve are thirty-six, without understanding the meaning of the one, or knowing the correctness of the other.

That "a thing of beauty is a joy for ever," is a truth which in the education of the rising generation has not been sufficiently considered. Yet, in order to enable the millions of English workmen, who are to follow us, and take their proper place, to feel this, we must open the young eyes to truthful principles: at present we are deficient of means to work out this desirable result—and should, therefore, carefully look for and apply new methods. It is by this consideration we are led to give our readers some account of a system of education which has been recently introduced, and is comparatively unknown amongst us.

It is a true saying, that at the first moment the child takes nourishment, its education has commenced: the infant has eyes—ears—and other organs of the senses so impressible, that to a great extent they can be moulded at will.

Roussean, at the commencement of the last century, said that education should be in accordance *with the laws of nature*, and the individuality of man should be respected.

Pestalozzi, that great reformer of his age, carried out a new principle of education—that of "a free and harmonious development of man's being from *within*." He particularly addressed himself to mothers for support; and if we look back to the history of eminent men in this and other countries, we shall find that the bent of the inclination and the extent of knowledge and of intellectual powers would seem to be due to the early teaching and watchful care of the mother. We could fill a page with the names of benefactors of the human race who have confirmed the belief.

All this proves that the early education in most instances makes the man or woman; and considering how important a thing it is to us in the present time of competition amongst nations to improve our artistic skill, it is most desirable that we should begin to consider that a feeling and knowledge of the principles of beauty and art are as necessary as the A B C's and the Multiplication Table, and should be applied as easily.

Feeling strongly on this subject, it is pleasant to know that F. Froëbel, a disciple of Pestalozzi, has introduced a system of education which seems to us to open out a path for great progress. The main desire in Froëbel's plan seems to be to carry out the idea that the fundamental principle of education "is the free, full, and harmonious development of all the faculties of the human being,—not by *pretending* to implant *something better in the children*, but by *educating every power* which a beneficent Creator has bestowed upon them."

The principle of discipline employed enables the teacher to avoid corporeal punishment. This is important; but it is, however, more particularly to this system of education, as applied to the arts, that we would now direct attention. Let us, therefore, get some materials together to show the working of the method.

The first things required are little children. Here then we have the young responsible being. We have, also, clay, wood, and other materials at hand, which can be used to educate them, but require science and philosophy to mould the matters supplied by nature to educational purposes. There is a principle of harmony in all; and it is the first effort of Froëbel's system to encourage and bring it forward. Without, however, dealing more with theory, let us communicate the knowledge which we have gathered by a visit to a school which has been established on this plan at 32, Tavistock-place, by the exertions of Johannes Ronge, a gentleman who has distinguished himself in the cause of education and liberty in Germany.

At the age of two years, and even younger, the children are admitted to the "*Kinder Garten*" (children's garden), and are presented with their first school gift. This consists of several tiny balls, each one forming a portion of the colour of the rainbow. The balls are neatly covered with worsted. The young child has thus put at the command of its hand and before its eyes a harmony of colours—representatives of the *harmony which slumbers in his soul.*

The spherical form of the ball is not without its use, for this, like the colours, is a harmony: the heavenly bodies are of this shape, so are the drops of rain and the sparkling dew: it is the most perfect of forms. The ball also calls forth the physical faculty of the child: when he throws it, the sight, the ear, muscles, and will are called into action.

The second gift comprises a roller, a cylinder, and cube. In these simple figures may be found the shapes of all objects in creation: the child does not know this, and yet he feels it. To help those who are more advanced to comprehend this principle, strings are fastened to the cubes, and moved so that the rotation shows the circle and cylinder within the cube, and also the cube and circle within the cylinder. This gift teaches the scholar the variety of forms, and he has acquired a certain amount of education when he can recognise the cube, the circle, and the cylinder.

Then comes the third gift. A very infant will lisp, "Give me something to do;" and it is certain that if the natural energies are not occupied in a right direction, they will, in nine cases out of ten, take an opposite course. The child will either create or destroy; and nothing can have a greater effect in promoting the latter faculty than the toys which are generally put into the hands of the young. A doll for little girls; the dress handsome, and not intended to be taken off: this is the ultimatum: nothing is left to improve upon: in consequence, the destruction soon follows. A hundred other toys are also finished to the children's hands, and meet with the same fate, causing more damage to the moral qualities of the children than the value of the playthings.

The feeling for investigation which is natural to us all to a certain extent, leads to the demolition of the toys. The child wishes to know what is in the inside of the monstrosities which squeal and mew and are supposed to represent a dog or pussy-cat.

The natural curiosity of the infant is, to a certain extent, gratified when he comes into possession of the third gift, by finding the cube—the form of which he has already become acquainted with—divided into eight parts: he has thus partially seen the inside of it, and finds, also, that it multiplies the means of enjoyment. He sets four of them together, and declares that they make a capital table. "Why, it is exactly like my old cube in shape, but smaller: however, it is like a table: I wonder if I can make a chair," and so on. "One, two, three, four, form the table; one, two, three, form the chair (fig. 1), &c.: I have made two tables, and have only two more cubes left; I must make the seats without backs (fig. 2). We need not go further into details, for all must know how the child or children will build, and plan, and invent with these forms: see the annexed examples (fig. 3): he builds a cross (fig. 4), one, two, three—the foundation; *one, two*—he finds a centre, and yet they fall—his last remaining cube consolidates the structure. The child has by the knowledge of this fact acquired an important part of both artistic and moral education.

The fourth gift, the oblong cube (fig. 5), also divided, adds to the stock of materials, with which he soon delights to build, or arrange in geometrical forms (fig. 6). He makes houses and bridges, and it is curious to watch the varied talent of a number of children: one says, "I will build a church:" he is active at the commencement, but tires, and another completes it.

It has been considered best, in the child-gardens, to arrange three classes of six each in one room. In the first instance, every scholar is encouraged to bring out his own ideas, and then is gently helped. The members of each class join in competition; and at intervals the three classes assemble together, and design geometrical forms, and build, by their joint exertions and materials, towns and villages, with churches, bridges, and accessories.

The fifth gift is the cube still more minutely divided. The pupil has now twenty-seven cubes in one box, eighteen of which are again divided (fig. 7). The triangle, that valuable form in art, is now added to the stock, which is still further increased by the sixth gift. He sees that all the varied forms of fig. 8 are but portions of his original cube, and that by them he can produce designs which not only convey pleasure to himself, but also to others (figs. 9 and 10).

This part of Froëbel's system of education is varied in many ways. To the very young two thin sticks are given, and something like the following dialogue takes place:—"See what I

FROËBEL'S SYSTEM OF TEACHING CHILDREN.

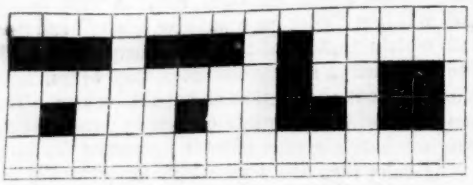


Fig. 2.

Fig. 1.

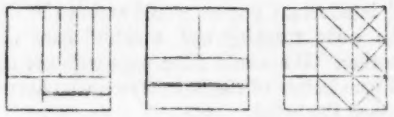


Fig. 7.

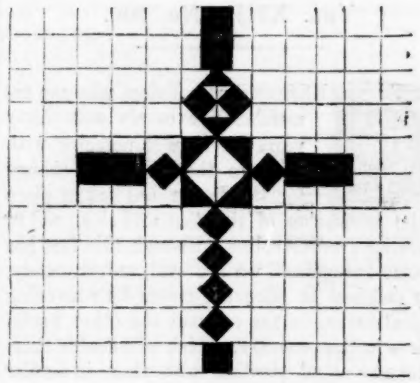


Fig. 10.

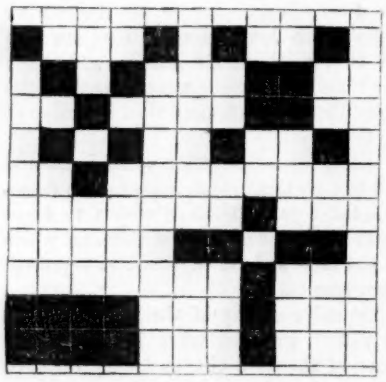


Fig. 3.

Fig. 8.

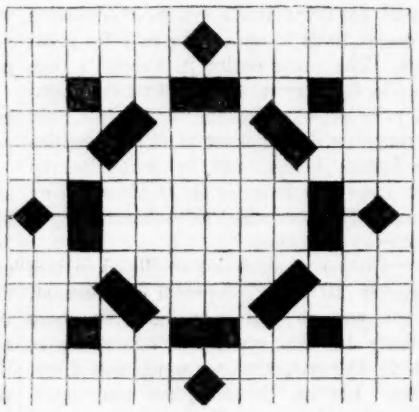


Fig. 9.

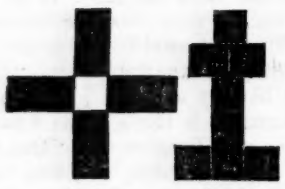


Fig. 5.

Fig. 4.

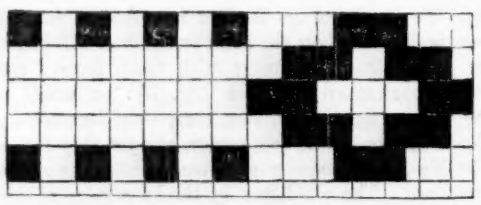
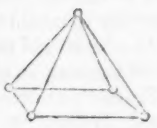


Fig. 6.



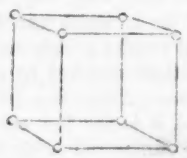


Fig. 12.

Fig. 11.

have made with two sticks." "Why, it is like a V," says one of the most learned. "I have made a table," says another. "It is like a T also," says the child of letters. "I have made a cross, see" (fig. 11). "I have made another cross." "One of them is like an X," says a little literary friend; and it is curious to watch at what an early time and how strongly the peculiar bent of the inclination shows itself.

Three sticks are brought into requisition, then four, five, and more; then houses, ladders, staircases. "I have made an axe," says one boy; others, a tree, ship, spades; one, however, with much self-complacency, says, "See here that cross boy George ran away when he was told to be quiet; but he fell down and upset the table. Here he is." The chief artist of the class, however, defies competition by his representation of "The Bird drinking from the Fountain in the Garden" (fig. 11).

Another sort of play, but which also has at the same time its philosophy, is carried out by each child being provided with a number of thin pieces of wood, which he is instructed to cut in equal lengths: he has also given to him a quantity of steeped peas. The pieces of wood are then stuck into the peas, and cubes, angles, and many forms, both complicated and beautiful, are formed by this process (fig. 12).

Squared paper is also used, which tends to develop skill in both design and colour.

"Play is the labour of the child." Froëbel has therefore invented numerous games and amusements. One of these is paper-plaiting. It will be observed, that the difference between the articles used in the infant-garden and the toys which are commonly given to children, is that the former, as we have already observed, are of finished materials, offered to the child to look at or be used in a given form, in imitation of the ideas of others. Froëbel supplies the children with materials with which they can produce an unlimited number of forms.

For the purpose of plaiting, paper of various colours is cut not quite to the sides, in equal divisions, and which are crossed by pieces of paper of corresponding width, of different colours; the child proceeding in the following manner:—The mat or paper, cut as already mentioned, is laid straight before the child on the table, and a slip of the paper put into the slit at the end of a wooden needle, which is passed through the cut mat, and the slip of paper drawn after it. The pupil may either have patterns to copy, or he may be left to design for himself. When the mat is so far finished, the whole of the slips are carefully arranged in their proper places, and the sides of the mat gummed or pasted on them, to keep them from moving: the whole mat is then gummed to a piece of plain paper, and, if necessary, varnished; and when dry it will be fit to exhibit. Besides mats for vases and figures, letter-racks, pocket-books, and various articles may be made out of these simple pieces of paper. It is a pleasant sight to see children of from three to four years old engaged on this work: one has got a blue ground, and chooses the most violent contrast of red to cross against it: another with a nicer sense of harmony, chooses a less harsh tint,—and some seem to have so little idea of the opposition of colours, that they choose a tint which can be barely discerned from the back-ground. Some are so apt and patient, that row after row is finished with neatness and despatch, while others tear the papers, and are less steady at their work—all have not the same gifts, but it is evident that to those who have the least eye for colour the practice of thus playing with various hues, aided by the example of others, must be a great means of improving the natural talents.

Not only are those faculties which tend to the practice of the arts, mathematics, and mechanics, the perceptions of form, figure, beauty, harmony of colour, manual dexterity order, and perseverance, fundamentally taught

by this system, but also the harmony of sounds, for many of the games with cubes, balls, rollers, &c. are accompanied with songs, which awaken the intellect, exercise the voice, and give a taste for the harmony of sounds, which are so fitting in company, with harmony of form and colour.

The multiplication table and the simple rules of arithmetic, are taught by means of the cubes: they carry the numbers in their little hands, and soon acquire a fixed knowledge of the value of figures; thus,—

Twice □ cube are □□ cubes.

Twice □□ cubes are □□□□ cubes.

Nor has Froëbel in his system for the infant-gardens, neglected the development of the eyes, ears, and muscles, and for this purpose gymnastics and other games are brought into requisition.

Many of the little songs are of great beauty. In some of these games the motions of the husbandman, and the working in various trades, are simulated in the songs. The children are also provided with leaping-poles, swings, &c. &c.

It is satisfactory to know that the system of Pestalozzi is extending in practice, particularly in those schools in which the strength of our industry is raised. In the Home and Colonial Schools in the Gray's Inn-lane, from eighty to 100 young women are constantly in the course of education for schoolmistresses, and from this place 200 and upwards of skilful teachers, who have passed the examination of the Government inspectors, and been provided with proper diplomas, yearly start forth to various parts of the country and colonies to spread the blessings of education amongst the multitude.

In this school there are from 300 to 400 children of different ages, who, whilst obtaining a good education themselves, are the means also of perfecting the teachers, who are themselves arranged in classes, presided over by professors of distinguished ability. In this school the children, to a great extent, are taught not so much from books as from the objects themselves, and models.

Here is a museum of minerals,—of the cotton plant, the various stages of its manufacture,—models or drawings of the machinery used in the working of the raw into the manufactured material.

There are the horns, skulls, skins, and skeletons of animals, plants, seeds, roots, &c. &c. In fact, practical knowledge is here taught in such a manner that we believe many a child of six years old, educated at this school, will puzzle some of the elders who have been brought up in the old methods, and who shake their heads, and say they "do not know what things are coming to."

It is an important fact that the *useful knowledge* materially helps the acquirement of figures and the higher branches of education, and nothing which we remember to have seen for years has given us more satisfaction than a careful visit to this institution, in which we knew not whether most to admire the system and order which prevails, or the intelligence of the teachers, or the scholars.

In the infant classes, models of furniture and articles of domestic use, &c. are employed, as a means of education, but for the purpose of paving the way to a knowledge of art Froëbel's system might, for the infants, with great advantage, be introduced in all its integrity. It is true that art-education is not overlooked in the Home and Colonial, and some of the other schools of similar kind in London, but it is not made of sufficient importance. In the national schools, which are doing so much good in all directions, drawing is now, fortunately, not altogether neglected. A lesson is usually given twice a week, the master employing a black board, and the pupils following him on their slates. This, although an improvement upon the old plan, is, for any substantial purpose, totally inadequate. Why not have a lesson on art every morning and afternoon, and let it be done in earnest, and not treated as a piece of education tagged on as a useless ornament? Only let this be done with energy and judgment and we venture to predict that many millions of sterling value will be added in a few years to the art manufactures of the country.

That the germ of art slumbers amongst our population has been shown to us in many instances. One of the most striking is the following:—

In the wild lead-mining district of Alston, the miners consist of an honest, industrious, and intelligent body of men. Until lately, however, not much care was taken for education amongst them. Mr. Sopwith, a gentleman well known for his ability and anxiety to improve those by whom he is surrounded, was appointed to the management of this important neighbourhood, and found only a school of the old fashion, and which was quite inadequate. He went vigorously to work to reform this evil, and in the new school made the practice and knowledge of drawing an important consideration. In a short time this produced visible effects, and we saw not long ago specimens of the work of the children of the rough miners, consisting of outline and shadow heads after Michelangelo and Raffaelle, flowers copied from nature, and views. These children commenced by drawing the simple geometrical forms on a large scale, without instruments, and it would surprise the practised artist more than others to note the wonderful firmness of hand shown in the latter copies, and the skill and taste of the more finished works. Who knows but that from this school amongst the moors of Alston, some artists may rise up who may do credit to our school of painting. At any rate, the knowledge thus acquired will not make the boys less intelligent as miners, or the girls less useful as wives or mothers.

THE RECENT HISTORY OF ARCHITECTURE.*

WORKS OF HENRY HOLLAND, JAMES WYATT, AND OTHERS.

DURING the period to which we have referred, such study of Gothic architecture as there was, was almost confined to the style of the ecclesiastical buildings. Just as it was a popular axiom that there was one general style called "Grecian," which consisted in the application of "the five orders," so it was held that there was another called "Gothic," which was expressed by pointed arches. With that the ordinary public were *au bout de leur Latin*. We must not complain too much of the architects. To have suggested that a building might be very good in art, and correct in style, and yet have none of the usual landmarks, would have been for the architect to raise a question as to his knowledge of his art and his business. We fear the architect has still the same kind of difficulty, albeit modified in degree, or in kind; for it is quite true that an ill-educated public makes bad architects. Ignorance ever believeth itself to be very wise. Therefore, it was that the country gentleman built for himself a "castle," or an "abbey," or at least a pointed—arched, and buttressed structure, which to him seemed the kind of residence that must have been common in the middle ages. "The house at Lee," said Walpole, "which was but indifferent before, has been, by the skill and art of Mr. Wyatt, admirably improved in the disposition of the apartments. Amongst them is a very beautiful library, finished in the most perfect style of Gothic taste. The three fronts of the house convey the idea of a small convent, never attempted to be demolished, but partly modernized, and adapted to the habitation of a gentleman's family; and the gently spreading trees, and the adjoining rivulet, seem to correspond with it, and to form a site selected by monks, with a view to retirement and meditation; while at the same time, no distant prospects tantalized them with views of opulence and busy society." Such, as a specimen of amateur criticism by the great potentate in what was called art, is enough to make us forswear again looking for information at any similar source. Brayley, however, supplies some particulars, which will assist in forming an opinion of the taste of the day. He says, "A small spire crowns the dome of the library, which as Lord Orford has intimated, is fitted up with the greatest elegance; and though an eye critically versed in the *minutiæ* of our ancient architecture, may discover some anomalies in the ornaments, when considered in reference to the pure style of any particular era, yet the effect of the whole is extremely beautiful; and the mind dwells with admiration on the fine example of good workmanship and exalted taste which this structure exhibits. The general plan is an ellipsis, formed into eight compartments by clustered shafts: from these springs the tracery of the dome, the centre of which admits the light that falls upon it from the windows in the spire above, and is mellowed by passing through a medium of stained and semi-transparent glass. In a recess at the east end is a kind of altar-table, over which are paintings of eight small whole-lengths by Mr. John Carter," "in niches, with various beautiful minute figures above, of angels playing on different musical instruments." "The entrance to the library gives the idea of a small oratory or chantry chapel." The *Strawberry Closet* was "a small room, very elegantly fitted up in the Gothic taste, with a ceiling of rich tracery." The point to observe herein, is, that with all the errors in detail, and the more serious misconception as to the purpose of *art*, there was some result not wholly contemptible: whilst the present system is to vilify and shut out, totally, all that was done under such circumstances;—though a generous, as well as an enlightened spirit, would not deny at least the possibility, of reaping advantage from recent examples, as well as from those which are old. To the state of taste referred to are due such mansions as Eaton Hall, near Chester, the residence of the Marquis of Westminster, by Porden, and which, whilst it is a good instance of the kind of mistake that was made, it must be allowed is in parts, by no means without merit. The imitation of the Chester Chapter House in one portion of the building, may be mentioned as serving to exemplify the effect which was in some measure obtained, and yet the mistaken conception in this class of works generally. We are not sure whether the earlier, as well as the later building at Fonthill, is to be credited to James Wyatt; but however defective his work might be, the interior must have been impressive even to a modern purist in Gothic. "Old Fonthill," said the author of "Vathek," "had a very ample lofty echoing hall,—one of the largest in the kingdom. Numerous doors led from it into different parts of the house, through dim winding passages. It was from that I introduced the hall [of Eblis, in Vathek]—the idea of the hall of Eblis being generated by my own. My imagination magnified and coloured it with the eastern character." Our quotation is from the *New Monthly Magazine* for June, 1844, where are some interesting personal "recollections" of that singular character, the owner of Fonthill, contributed, we believe, by Mr. Cyrus Redding. On Beckford's return from Portugal, he embellished the house at Fonthill; but in 1801 he sold its contents by auction, preparatory to the erection of a new building, and the formation of another collection of works of art. The grand feature of the new building was a hall or octagon, spanned by lofty arches springing from massive clustered piers, and giving an effect which might be compared with that of the central space of the cathedrals. This octagon was crowned by a tower, rising to the height of 260 or 270 feet, and from which there was a view described in one of the few popular periodicals of the time now before us, as "of vast extent, including many counties in its circumference." The interior was fitted up with extraordinary splendour. Throughout, however, the idea of imitating or representing relics of former art, and almost, as we may say, *incidents of history*, is remarkable. An "oratory" was indispensable.

* See p. 446, *ante*.

The "solemn gloom" of this was approached by doors hung with crimson curtains; the fan-groining of the roof was entirely gilt; from the centre hung an elaborately chased golden lamp; the altar had a statue of St. Anthony, in alabaster, by Rossi, and massive candelabra of silver gilt. The account says that no description can convey an idea of the effect of "this solemn recess," or of "the awful sensations" it inspired. Yet, if we understand rightly, all this may have involved, from the manner in which the effect was attained, a great mistake in point of *art*. In 1822, not long after the completion of this splendid house, and after its proprietor had spent about 270,000*l.* upon it in sixteen or seventeen years, he sold it for 350,000*l.* and soon after this, the great tower, which seems to have been hastily and slightly constructed, fell to the ground. Wyatt's works in Gothic architecture, belonged to that class where what was stone is reproduced in cement, or is constructed in wood, painted and sanded; and in the cathedrals which suffered under his hands, many are the maledictions which now are hurled at the restless ghost of James Wyatt. To him the profession mainly owes the suspicion with which they have had to contend in the case of works of restoration, from that day to this. During the period of the war, however, the study of Gothic architecture was growing. John Carter's drawings of cathedrals and other edifices were published by the Society of Antiquaries, at intervals from 1795 to 1813. Mr. Britton commenced his "Architectural Antiquities" in 1805. Eaton Hall was in progress from 1803, we believe, up to 1825. Ashridge House was commenced in 1803; the works after 1813, up to 1820, being under Sir Jeffrey Wyatville. The list might be continued with the works by Sir Robert Smirke, Mr. T. Hopper, Messrs. Nash, Repton, Blore, and others, and with those at Windsor Castle, Alton Towers, and Abbotsford,—down to the house at Toddington, in 1819, which has been fully illustrated by Mr. Britton, whose work may be referred to with advantage for further particulars as to this period. The last-mentioned building, and Cossey Hall, Norfolk, by Mr. J. C. Buckler, are far superior to most of those we have mentioned. Toddington, the residence of Charles Hanbury Tracey, esq. afterwards Lord Sudeley, is said to be designed by the owner. There is still much of ecclesiastical character in certain parts; but the style, which somewhat resembles that of the Houses of Parliament, is not a slavish representation of any kind of Gothic. The plan is that of a modern house. There is a grand tower in the centre. The details are very elaborate, and show great progress in the knowledge of principles; but internally, modern furniture in some of the rooms seems slightly inconsistent. Cossey, or Costessey Hall, of which there is a good model at the Institute of British Architects, is a very extensive building, in the red brick Tudor style, and is, perhaps, still one of the best specimens of domestic Gothic architecture in the kingdom. Credit for great part of the design has been given to Lady Stafford. We are, however, anticipating dates. But we should have mentioned a few other works of the class referred to, and of varying degrees of merit. Ravensworth Castle, in the "castellated Gothic" style, was commenced in 1808. The original drawings were by Nash, but the works carried out are said to have been designed by the Hon. T. Liddell, a son of Lord Ravensworth. Lowther Castle, Cumberland, by Sir Robert Smirke, was commenced in 1808. It has a hall 60 feet by 30 feet, and a staircase, 60 feet square, and 90 feet in height. This building, therefore, as well as Eastnor Castle, Herefordshire, by the same architect, may show the effect which was aimed at, and to which we referred above as worthy of consideration in any comparison of the styles of different dates; but the result in these particular cases, Mr. Britton says, fails to satisfy. Other important works of the class were those carried out at Corsham House, by Nash, or his pupil, Mr. J. A. Repton. Mr. Britton's Illustrations of Cashiobury will supply information as to what was done there by Wyatt. The taste of the Lord Shrewsbury, of 1814, at Alton Towers, seems to have been illustrative of the mistakes which could be committed. An imitation of Stonehenge, a tower down in a hollow, and a Gothic bridge over no water, are quoted as amongst the absurdities perpetrated in spite of architects, and in contempt of art, and which the late Welby Pugin had some trouble in undoing. Penrhyn Castle, near Beaumarris, if we may speak from recollection, realises some considerable effect as a work of castellated character,—a great contrast to Downton Castle, Herefordshire, the residence of the celebrated writer on Taste, Mr. R. Payne Knight, or Grweh Castle, near Abergeley, Wales (perhaps later in date), at the foot of a hill, both buildings mere card-board-like imitations of fortresses. The work of Sir Jeffrey Wyatville, at Windsor, at length, and itself alone, showed to some extent of what the castellated Gothic style could be made capable. During this time, as it will not be forgotten, the influence of the Greek models, was progressing. Covent Garden Theatre was completed in 1809, by Sir Robert Smirke, and at the same date, we find one of the chief works of Harrison, of Chester, the Exchange at Manchester, lately remodelled. Aikin's Essay on the Doric order, an important book at one time, was published in 1810.

We are reminded by the name of a writer above mentioned, that our subject would hardly be complete without a reference, however slight, to the discussion which was carried on towards the commencement of the present century, on the principles of taste. The exemplification of the different theories was made through the medium of landscape-gardening; Sir Uvedale Price and Payne Knight advocating the rugged and irregular, both for houses and grounds,—of which theory the latter gave an unfortunate practical illustration in his house at Downton; whilst the professional gardener Repton argued for smoothness, neatness, and simplicity as the accessories to a mansion. Each of these authorities published treatises, to which might be added those of the Rev. W. Gilpin and many others, which along with the French opinions to which we alluded on the subject of the ideal, might be very important to us in an estimate of the true object of art, and the relation of art and nature. So far, we see no reason to doubt that the proper force of architecture is effected through *contrast* with the beauty of nature: we believe also that the efforts of the picturesque school of landscape-gardening are generally unsuccessful. The whole accessories of the foreground of a house have a chief place in the effect: the architect should therefore be entrusted with them, and must be qualified accordingly. The villas and suburban palaces of Italy depend very greatly for their effect upon the intimate union, and yet the contrast of the objects of nature and art, and the same considerations were not neglected in the English Elizabethan buildings. The palace of St. Cloud seems to owe what effect it has mainly to the treatment of accessories such as we refer to. Those who would know what can result at home, from the course we have recommended, should see the grand effect of the house at Chatsworth, to which, amongst the other additions to the work of Talman, Sir Jeffrey Wyatville added a noble terrace, and "architectural garden."

With reference to the attempts in Gothic architecture, it was, as we have said, long, before principles of detail, such as now appear simple, were understood. Meanwhile, many churches had to be built. In these the Palladian, the Greek, or the Gothic was adopted, with no particular preference that we can discover for either style. In general works which we shall have to notice, as erected after the end of the war in 1815, the same contradiction of styles is continued in the works of Soane, Nash, Smirke, and others. The first of these, indeed, seems to have adopted the Gothic style in but few instances, and then in deference to the dictation of employers.

After 1809, the date of Covent Garden Theatre, the number of porticoes in London largely increased,—and it may be interesting to contrast the use which was made of the Greek models in England with that made by the German architects, as Schinkel and Klenze, whose career towards 1810 was about to commence. One acquisition which resulted from the war was that of the Rosetta stone. Contributing in a most important degree to the knowledge of hieroglyphics, the study led to those occasional experiments in Egyptian architecture which were not more successful here than in France.

We humbly confess that whilst we give facts and suggestions which may be useful in comprehending the curious position in which our art is now placed, we require all the assistance of our thoughtful readers, in arriving at conclusions from the premises; and the difficulty of even a clear reflection of *facts* was never greater than in the period of the different fashions which we find during the course of the professional career of Nash and his contemporaries, but which peculiar conjuncture of taste appertains to the admired architecture of Munich, as to the less-appreciated works of London.

THE CHEMISTRY OF BUILDING MATERIALS.*

THE word "silicious," which gives its title to a large class of bodies, is derived from the Latin word "*silex*," meaning flint, and from its genitive *silicis*, we have *silicious*, the purport being, that all stones so termed have in them about half of their weight of the same substance as ordinary flint, which, when pure, is named Silica. Sandstones are practically nothing but silica. Some rocks, such as serpentine, have not more than about 42 per cent. of silica; but, on the whole, the silicious building stones contain from 50 to 98 per cent. of silica, and those which are in use in this country, namely, sandstone with 98, and granite with 74·84, consist more of silica than of anything else. What the old Romans called *silex*, the modern chemist thus calls silica and also silicic acid, for, though it is not sour to the taste, it has the powers and properties of an acid. The chemist prepares it in the state of an exceedingly fine white powder, and in that condition it does not dissolve in water or melt by ordinary heat, and is not affected by any of the common acids: it is, in fact, one of the most enduring and least alterable substances known to us. Yet we can procure it in a soft, pulpy, and gelatinous form, in which you could not tell it from ordinary boiled starch in the condition in which the laundress uses it; and we find that, artificially, we can crystallize it. In nature we obtain it in the form of regular geometrical figures, having always either the same shape or shapes, limited within a certain series. In crystals it always holds that the smaller are the most perfect. They will be seen to be shapes which represent what crystallographers term a six-sided prism; in other words, a column of any length which has six faces, the top of each column or crystal showing a hexagonal plane exactly like the top of the six-sided honeycomb cell of the bee. Such six-sided prisms may exist entire, but are very rare, as the majority of silicious crystalline forms have shot up out of the rock, which is their matrix, and are embedded at one extremity in it. The large crystals are sspecially irregular.

The substance, then, termed flint, silex, silica, silicic acid, or rock crystal, is the main constituent of the building stones about to be noticed, and in fact, is the main constituent of the great masses of rocks occurring over the surface of the globe. There are just two great masses of mineral matter forming rocks, the one lime, the other silica, and it is to the silicious descriptions of rock we are now to look.

Granite derives its name from the Latin word *granum*, a grain, so that the word literally means grainstone—in other words, a granular rock, a rock made up of separate grains, sufficiently large and unlike each other to be distinguished by the naked eye. The smaller grained granites, those where the crystals are the smallest, illustrate best the granular character of the stone, especially if we look at it on the unpolished side. Such a granite as the Peterhead illustrates the point well, though perhaps the grains are rather larger than in the majority of granites used for building purposes. Now the grains making up granite are always crystalline; that is to say, they are not rounded in form, but, like the crystals which I referred to previously, they have planes or flat spaces,

* See pp. 435 and 437, *ante*.

and sharply defined angles or corners. In those granites where the particles are small, these grains appear embedded or wedged together like so many paving stones in the street. They appear as if they had been all crushed or wedged, or rammed together, so as to fit tightly, and do not permit one readily to see what the particular configuration of each single grain is. But in favourable circumstances, we see granite permit each one of its constituents to lose this irregular and squeezed condition, and to shoot up into separate crystals, each crystal projecting from the under mass, as church spires or obelisks do from the general outline of a city, and being unlike the others in shape, colour, and size.

These constituents are each of importance in reference to the durability and beauty of granite as a building stone.

The first is quartz, rock crystal, or silica. To illustrate this constituent of granite rocks, large crystals like Cairngorm were exhibited, some of them many feet in length, and from a single one of which, it was said, as much as 400*l.* worth of jewellery had been cut in Edinburgh. These crystals, continued the lecturer, are one of the three components of granite, which, instead of remaining wedged in among the others, has shot up in separate spires or distinct crystalline columns.

In regard to colour, rock crystal or silica may be termed colourless. The very word "rock crystal" is intended to signify something occurring in rocks as colourless as the purest glass; and large quantities of silica are found native, totally devoid of any tint. It is often also grey, or yellow, or amber, as in our most prized Cairngorms, also dark brown and black, and purple and blue as in the amethyst. So far as shape is concerned, it is in the six-sided column already referred to. As for size, we may have it from minute grains up to crystals some feet in length.

This quartz is one of the silicious components of granite, but silica occurs again in the other two crystalline bodies making up the mass.

The second of these bodies is named *mica*, from the Latin word to shine—this substance having a glistening appearance. Though it may appear brown or nearly black by reflected light, it is transparent, and in large pieces used to be employed instead of glass for the panes of windows. It is still employed in India and in Russia for the windows of stables and for lanterns, being less easily broken than glass. At the edges it spontaneously splits into a number of films or layers like so many thin sheets of paper; and we find that this characteristic of mica gives a peculiar character to the sandstone derived from granite, or other rocks containing this body. The mica is that constituent, in the granite, which occasions the black spots appearing through it. In every specimen of granite, whatever be its prevailing character, these black spots occur, and it is they which mainly produce the mottled or granular appearance, and enable the eye to detect readily the want of homogeneous structure. Occasionally the dark spots are owing to dark quartz, but not generally.

The third constituent of granite is called felspar, from a German word literally signifying field-spar. It is a shining opaque spar. Its colour varies. It is sometimes white; more frequently of a flesh, or grey, or cream colour, and occasionally of deep red. Specimens of Labrador felspar show a very beautiful iridescent appearance, or a peculiar play of colours like the wings of a pigeon, or the feathers of a peacock. This felspar is a very abundant mineral, and forms a large part of all granite as well as of other rocks.

Granite, then, is a granular rock or grainstone, with three kinds of crystalline grains, one set being of silica or rock crystal, which are often perfectly colourless like glass, the second set being of shining glistening mica, and the third set being grains of felspar, glassy-like, but opaque, and generally whitish or flesh-coloured, so as to resemble a glassy marble.

Now as to the relative significance to builders of these bodies, which of the three is the most important in reference to the qualities of granite as a building stone? Without doubt, the most important is the felspar. In the first place, it mainly determines the colours of the granites, which are of various tints, some having a grey colour, approaching to white, many having a duskier or darker grey, some having a very deep grey, many with a brownish or buff colour, some of a bluish or flesh colour. The well-known Peterhead granite is of a deep flesh colour; and in the Oriental granites we have a full red colour. Now the colour of granite is mainly determined by the felspar, and next by the mica, which, if very dark, comes to affect the shade of the felspar. But of more importance than as affecting the colour, is the relation of the felspar to the durability of the stone. The condition of the felspar mainly determines whether the granite shall maintain its proverbial character of being the most lasting of stones, or whether it shall be one of those which most easily give way. Felspar is always the first ingredient in granite to yield, if the granite undergoes marked disintegration or decay. As already mentioned, felspar contains two alkalis, potash and soda. These are soluble in rain water, and many specimens of felspar, though when one looks on them they seem to form a solid, enduring, stony mass, very rapidly give way when exposed to the air, and come, indeed, by so crumbling, to be the source of a substance of great value, namely, the fine clay used in the making of porcelain. But, of course, to convert building stones into porcelain clay, however valuable that may be, is not what the architect desires to accomplish. Accordingly, in selecting granites, one needs to be very careful in watching the condition of the felspar; for the more glossy and brilliant it appears, and the less earthy its appearance, the more enduring is it likely to be. It is not desirable, moreover, in selecting a granite for building purposes, where one knows nothing of its history and of its trial in actual buildings, to select one where the quantity of felspar is very large. The Scottish granites are proverbially lasting, and no one of them is very rich in large crystals of felspar. The Cornish granites, on the other hand, have large crystals of felspar in them, and that felspar has not a glassy, but an earthy look; and many of them may be made in a few weeks or months to crumble into a white mass, and then permit the mica and quartz to separate from the felspar, and thus the whole undergoes complete destruction. Occasionally, however, granites are found with large crystals of all the three kinds. In some instances we have a perfect granite on a large scale—everything big; but where the mica and quartz are small, and the felspar crystals are large, and are at the same time rough or soft, then the granite is suspicious, and is to be distrusted.

The least important of the constituents, in a building point of view, is the mica. It is the least abundant constituent of granite. It does not readily decay, though it will split into scales if long acted upon; but it is not readily affected by rain or wind, and is not soluble in water.

The quartz or silica may be put in the middle, between the mica and the felspar, as an index to the building value of the granite. It is the hardest constituent, and is that which makes it difficult to hew. It should always, however, be abundant; for if granite be troublesome to cut, it compensates for that by its lastingness. The value of this lastingness is to a great extent to be measured by the difficulty in polishing, hewing, or otherwise fashioning the stone.

So far as regards the localities of granite in this country, I need scarcely mention them further than to say, that the Grampians consist largely of granite; that in Cumberland, Devonshire, and Cornwall, we have it abundantly; and that in Ireland it is found in large quantity in the county of Wicklow. For paving purposes—a use to which it is not much applied in Scotland, where it is generally objected to on the scare of its becoming slippery, though in London, Liverpool, and elsewhere, it is largely used in that way—the Cornish or Devonshire granites, which are not so hard as the Scotch granites, are held to be better, as you do not require for paving the most enduring granite, nor is there any architectural beauty to sacrifice in the choice of a paving stone. It is not like the case of a splendid erection, in which the smallest deteriorating influence is something to be lamented, and for paving you do not require a very hard stone: indeed, the harder granites certainly become too slippery. For building purposes, with the partial exception of the Dartmoor granite, the grey Aberdeen granite, and the red Peterhead granite, stand above all others in this country. A special value attaches to the granite of Mount Edgecumbe, Cornwall, which has felspar, with nearly as deep a red as in the Oriental granite, and for its beauty it is now selected for a few purposes; but it is not largely used, so far as I know, anywhere.

There is a kind of granite called Syenite, which I merely name. It may be called a large grained granite. It receives its name from a district in Upper Egypt, where large quantities of it occur. Some of the most beautiful Egyptian statues are cut out of it. Syenite does not differ markedly from granite in constitution, except that it has no mica in its chemical constitution, but another mineral like it, which is called "hornblende."

It will be observed, that in mica there is a very large amount of silica, as well as in felspar, so that if we were to put down the silica separately, in each of the crystalline components, it would occur three times over.

Alumina, the next important component of granite, is what has been mentioned as clay earth. It occurs almost entirely in the felspar; oxide of iron also occurring sometimes in small quantity in the darker rock crystals, and giving them a tint. To mica it gives its brown tint, and to felspar its flesh or red colour. Lime, magnesia, and potash, occur alike in the felspar and the mica, but not in the quartz.

I now pass from granite to other silicious building stones—and first of the sandstones. They are for us by far the most important of silicious stones. They are, in a chemical point of view, most interesting, as they contain the largest amount of silica of any stones. They are geologically derived from other rocks, as, for example, granite; and their characters vary according to the rocks they are derived from. I do not propose to trace minutely their derivation. That must be left to the teacher of geology. I will notice, however, that as silica is the most abundant constituent of all rocky masses, and as it is a body very little alterable, it may separate from any one of these rocks, and come ultimately to form a sandstone. Putting aside limestones and calcareous rocks, the characteristic ingredients of which are lime or magnesia, or both, you will find that the trap-rocks, basalts, greenstones, the whole of our slates, syenite, gneiss, serpentine, and many others, contain more of silica than of anything else. They are all liable to be worn down to powder by the action of rain, wind, and water, and the silica thus worn out of them is not a thing alterable in itself, and may be deposited and reformed into a stone. Sandstone may thus be derived from a great number of rocks, unlike in kind, and the qualities of the sandstone will correspondingly vary. If we take, for example, whinstone, a name we apply to what geologists term greenstone, we shall find that a very large portion of that stone is silica, as we have seen that a still larger portion of granite is silica. Now, if whinstone be reduced to fine powder by the action of the water of rivers, or of the currents or tides of seas, we may ultimately have the silica separated from the other components of the stone, and converted into a solid mass of sandstone. Sandstones so produced are to be found all the world over, differing in character according to their derivation from one kind of rock or from another. If I were to reduce one of the granites or whinstones to fine powder, and then throw the powder into a large vessel containing water, stir it there rapidly, allow it to stand, and in a short while pour off the water, and along with it the finer powder, I should be able in this way to separate the lighter from the heavier particles, and ultimately I should find left the heaviest portion, namely, the silica or sand, as a sediment at the bottom, which might be dried up into a substance resembling an unconcreted or unconsolidated sandstone. What I do on a small scale, when I stir the powdered rock with water, and then pour off the water, rivers and seas have been doing since the beginning to rocks on a very large scale, and in a much more effectual way. Suppose, then, what we can see any day

in our Highland hills, that we have the granite or greenstone undergoing disintegration, whether by the action of the water or the air, and that the fragments are borne down and fall into the bed of the stream. They are carried along, rubbing against each other, and in fact grinding each other, so that all angularity of shape disappears. The separated crystals, for example, as in the case of granite, which once showed a six-sided pyramid or prism, become very soon rounded pebbles; and then the pebbles, rubbing against each other, are ground to still finer powder, and this carried down into lakes or the sea, is ultimately spread out in a stratum on the bottom of the body of water. Still more, the waves dashing on the rocks close to the shore, break down fragments from them, and rub these fragments against each other, and when they are brought back by the tide they are never sharp or angular, but always rounded pebbles, and some of them so round that you would imagine they had been cast in a mould. This rubbing, moreover, reduces much of the fragments made to undergo friction against each other to fine sand, so that there is nothing we so much expect to see along the shores of a lake or river as this sand. Altogether, when we look at the effect of water in wearing down and grinding against each other masses of stone, we find that there are three sets of things encountered in river beds, on the shores of lakes, and on the beaches of seas, namely, *first*, pebbles or gravel, always rounded, however sharp or crystalline they may have been at first; *secondly*, mud, that is to say, a fine soft powder, diffused like boiled starch in water; and *thirdly*, sand in fineness intermediate between the pebbles and the mud, and forming a hard powder. Now each one of these three deposits may become altered in structure, by allowing it simply to remain at rest at the bottom, covered over by successive sediments deposited above it, and ultimately it may become changed by the lapse of time, by pressure, by heat, and by other causes, into a solid mass of stone. The pebbles or gravel, for example, become agglutinated, or cemented, or concreted, by clay, or lime, or iron, or all the three, into a mass we call conglomerate or pudding-stone. Masses formed of mud are baked as clay in the bottom of a lake or sea, and hardened into slates or flag-stones. Further, as the pebbles and the mud may thus concrete into pudding-stones and slates, so the sand may concrete into sandstone. Now, as we have two great classes of original rocks, which are worn down into mud, or pebbles, or sand, there are two classes of derived rocks from them, the one derived from calcareous rocks, and, like them, calcareous, the other derived from silicious rocks, and, like them, silicious. If we go to the sea-shore in some districts, we shall find a shell-sand,—a sand consisting altogether, or nearly altogether, of broken-down shells, and a very fine mud, consisting of ground-down shells; and again, we find that sand or mud cohering together into a solid mass, very like these slates or these paving-stones. But these are never called sandstones. They are all, whatever be their structure or appearance, or real or conceived origin, named limestones; and therefore I say nothing more of them at present. By the word sandstone we understand a body derived from the wearing down of silicious rocks, such as granite or greenstone, and which consist in great part of silica, or of silica alone.

As no sandstone probably has been derived from the mere wearing down of a mass of silica, but all of them from the wearing down of rocks like granite, having other things in them besides silica, we may expect them all more or less to contain foreign matters. Thus most of our sandstones contain some mica. We may see it very fine in some sandstones, giving them glossiness or a shining micacious glistening appearance. These glistening particles, however, are not desirable. They tend, like so many wedges, to split up the stone. They are deposited between one quantity of sand-powder that has been laid down, and another coming above it, and therefore disturb the continuity of the mass. The less mica, then, the better. This mica, moreover, as it contains in itself a portion of lime and of alumina, may transfer these to the sandstone; and when we come to look at the recorded analyses of sandstone, some of them are found to contain sensible quantities of lime and of alumina, which interrupt the solidity, the continuity, and the homogeneousness of the stone, and lessen its building value. Then we may have a fine black matter in these stones. When sand has been carried down a river, on the banks of which plants grow and are blown over into the stream where they float down till they become water-logged and sink, there we very often have vegetable matter interspersed through the stone. These carbonaceous layers are to be found in more or less quantity in many sandstones. All these non-silicious substances interfere with the continuity, solidity, and tenacity of the stone, so that the less of them the better. Not only plants, but also animals, especially shell-fish, are found in the neighbourhood of these sandstones, or actually embedded in them, and from these animal and plant remains, bituminous matters are frequently transferred to the sandstones. If we take a fragment of Binney sandstone and heat it at a candle or lamp, a black fiery matter will be found to ooze out in little globules. This bituminous matter probably does no harm to the stone: I rather suppose, that like varnish, it protects it from the action of the atmosphere: at all events, it is a peculiarity in this stone, and may be connected with the peculiar changes in colour which it undergoes when exposed to the open air.*

PROVINCIAL NEWS.

Ryde.—The esplanade is making progress towards completion. It is contemplated, we hear, to plant a row of trees upon it when finished.

Winchester.—The new barrack buildings to accommodate the officers of the garrison here, the money for the erection of which was voted in the Ordnance Estimates of the past session of Parliament, are, according to the *Hampshire Advertiser*, to be commenced shortly. The site selected for the building is on the south side of the parade, and on the ground now occupied by the washhouses, armourers' shop and forge, and other offices, which are to be removed to the low ground abutting on the eastern portion of the parade, near the hospital, which is to be removed, and a new one erected, no site for which is yet fixed upon, but several suitable plots of land have been offered to the authorities for the purpose.

Dowlais.—The new school-rooms here, designed by Sir Charles Barry, are in the late Gothic style; but the unity of the design is broken in the smaller side windows, which are probably deviations from the original plan; yet the general effect is said to be good, and to suggest reminiscences of Tintern Abbey. The building consists of seven school-rooms, one for infants, and three each for boys and girls. The whole building is 235 feet long, by 100 feet in the centre, *i.e.* the infant school is 100 feet long, by 35 feet wide, and 50 feet high. The boys' school, south end, is 100 feet long, by 30 feet wide, and 30 feet high; and there are two class-rooms, one 25 feet by 21 feet, and the other 45 feet by 24 feet. The girls' school-rooms, north end, three in number, are of the same dimensions as those of the south end. The infant school has a singing gallery at one end and raised seats at the other. The whole structure is said to have cost about 7,000*l.* The builder was Mr. John Gabe, of Cardiff.

Birmingham.—The tender of Mr. Barnsley for the erection of the new museums at the Queen's College, from the designs of Mr. J. J. Bateman, architect, having been accepted, the work is already commenced. The buildings will comprise three museums, upwards of 40 feet square. The upper museum will be about 40 feet in height, with two tiers of galleries, and lighted from the roof, the ceiling being finished with Gothic spandril ribs, corbels, and pendants, in character with the other portions of the College. The lower museum will be entered from the quadrangle of the College, and be appropriated to anatomy, and will have a gallery round three sides of the room. The two upper museums will be appropriated to engineering models, mineralogy, geology, natural history, &c. The contributions towards the building are, we understand, very inadequate to meet the necessary expenditure; but when was it otherwise with shabby "Brummagem?"

Warrington.—The ceremony of laying the foundation-stone of the Warrington new museum and library took place on Thursday before last.——The new market committee received nineteen tenders for the erection of the market, only one of them from Warrington. There were ten estimates for the erection of the shed and iron-work, and eight for the erection of the building complete. The lowest tender for the iron-work and for the buildings separately, when put together amounted to 5,729*l.* The estimate for the iron-work was 1,400*l.* or 1,000*l.* less than that of Messrs. Fox and Henderson. The highest tender for all complete was 13,000*l.* but was reduced afterwards to 8,750*l.* on account of an error. The lowest tender was 1,000*l.* more than the sum named in the advertisement, but the architect, according to the *Manchester Courier*, is able to give a satisfactory explanation for the difference in his estimate and that of the lowest tender. The iron has advanced in price equal to 175*l.*: the stone selected by the committee is 6d. per foot dearer than that at first agreed upon. Stone pilasters have been substituted for brick ones. The turret for the clocks, through being removed from the west end to the south side, makes an additional expense of 400*l.* These items, if reduced, it is remarked, will bring the cost of the market-house and covered shed to about the amount fixed upon, viz. 5,000*l.* The market committee were to meet again to know what deductions the person that sent in the lowest tender can make, and then a meeting of the council is to be called to decide the question finally.

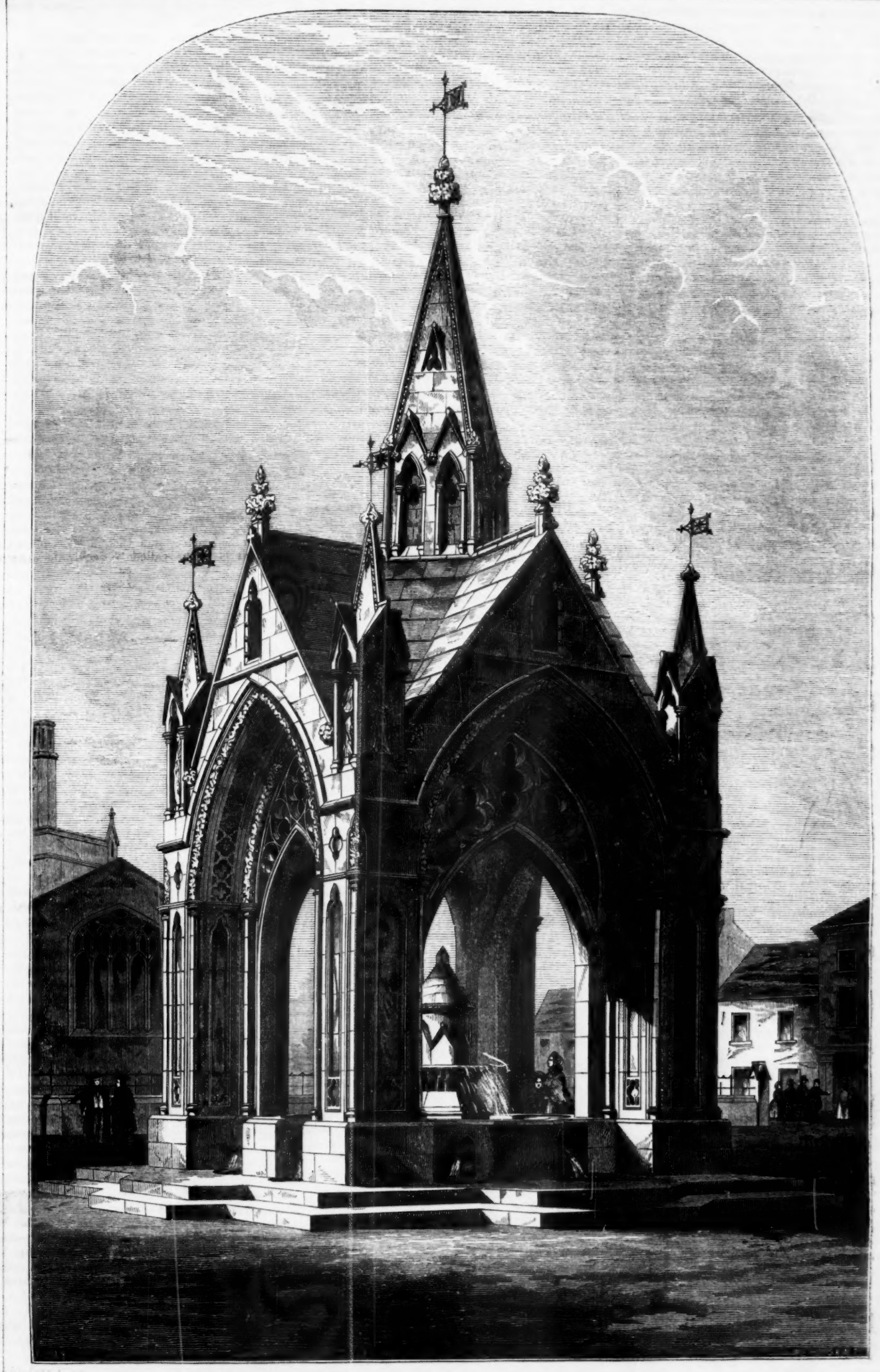
CAMBRIDGE CONDUIT.

THE corporation of Cambridge having enlarged the market-place of that city, it was resolved to take down the old conduit, which, by the enlargement, has been left in the south-east angle of the square. Accordingly, in April last, architects were invited to compete for the erection of a new conduit, as our readers have already heard, and the design of Mr. G. M. Hills, of London having been selected, a contract has been entered into for the execution of the work. The structure consists of a base of two steps, on which is placed a basin: in the centre of this rises a fountain, from which the water will flow in four streams into the lower basin, and thence escape by eight spouts either into the vessels of the inhabitants who use the water, or as waste into a flushing tank which has been constructed for the cleansing of the sewers. The basin and fountain are covered by a square canopy, carried on four piers, with an arch and gable in each face, and the building is crowned by pinnacles, with niches for sculpture at the angles, and a spire in the centre. The steps and basin, and plinths of the piers, are of Cheesewring granite, the superstructure of Ancaster stone, from the quarries of Mr. Wilson, of Grantham. The contractors for the work are Messrs. Boulton and Harris, of Lambeth. The cost, which has been somewhat increased beyond the first intention, by the use of granite instead of Portland stone, will be about 560*l.*

The new conduit will stand in the centre of the market square, and will harmonize in style with Great St. Mary's Church, which now bounds the site on the west side. The old conduit, which will thus be superseded (but we hope it will be elsewhere preserved), was built in 1614, from funds supplied by the celebrated Thomas Hobson, the carrier, whose stringency in letting his horses, for hire, only each one in his proper turn, regardless of the whims or likings of his customers, gave rise to the well-known proverb of "Hobson's choice—that or none." He appears to have been a wealthy and respected citizen; and, not content with merely raising the edifice, he left by will the sum of 10*l.* for further beautifying it, with an estate, the annual proceeds of which have ever since been available for its maintenance. Thomas Hobson died January 1st, 1630.

We are disposed to think the Cambridge citizens will have reason to be pleased with their new conduit.

* To be continued.



THE CAMBRIDGE CONDUIT.—MR. GORDON M. HILLS, ARCHITECT.

LEADEN PIPES IN THE SUPPLY OF WATER AND BEER.

IT is now some years since we first brought the subject of leaden pipes in water supply, and the poisonous contamination of water by lead in certain circumstances, under notice. To the surprise of the public, some time thereafter, it turned out that chemists, even some well known to fame, entirely differed as to the precise circumstances under which leaden pipes became dangerous in use for water supply. Soft water was most to be feared in the estimation of one chemist, hard in that of another, and the result has been a perplexity on the subject which still occasionally disturbs the public mind. That leaden pipes do, in some circumstances, poison the water that passes through them there is but too good reason to be assured, and it does seem passing strange that there should be two opinions amongst chemists on such a subject. Meantime, our present purpose is not to excite anything like alarm, but, on the contrary, to notice certain facts which tend toward the future settlement of this important question independently of chemists altogether, and certain others which will at least assist in hastening this desirable state of matters, by pointing out a new source of danger which has lately been not only discovered but already guarded against by our acute neighbours the French.

The Minister of Commerce, Agriculture, and Public Works in France, we are informed, has issued a circular, under the head of public health, to all prefects, calling upon them to put a stop to the use of lead, copper, and zinc pipes, in breweries, and states that experience proves that beer, by simple contact with lead, takes up an appreciable quantity of that metal, and thus acquires poisonous properties. In continuation, he points out that not only are leaden pipes used in breweries, but that a custom has arisen in taverns, and in houses where wine is sold, of using a small pump, which communicates with the barrels in the cellars by means of a leaden pipe, and that the use of lead is in this instance peculiarly objectionable. The minister instances a case in which a whole family was poisoned by using for some time a pump of this kind for drawing their ordinary consumption of wine.

The pumps alluded to by the French minister are, doubtless, either the same as our own "beer-engines," or an equivalent for them, and it is well known that leaden pipes are used in connection with such engines; so that to the other mischiefs which beer and other intoxicating liquors produce must be added the serious influence of lead poisons on the drinker. If the precise amount of injury done in this way could be ascertained, there is little doubt but that it would he of a startling character, and only second in importance to that produced by lead in water supply.

The means of putting an end to these evils without the aid of chemists is now a question of great and pressing importance. It was proposed, so long ago as the time of Vitruvius (and even then the risk of poisoning from the use of water conveyed through leaden pipes was known), that lead should not be used at all in connection with water supply; but the fact is, that lead cannot well be got entirely rid of, as it is so suitable, in many respects, to the purposes of water supply; and, unless the new metal aluminium turn out to be of cheap, easy, and abundant attainment, lead doubtless *will* continue to be persistently made use of far more than either zinc, tin, iron, or gutta percha, for small pipes in water supply. In these circumstances, if leaden pipes could be well coated interiorly with some more or less innocuous substance, we should have all that was requisite for the safe conveyance of our water supply through leaden pipes. A patent, we observe, has been taken out by Mr. F. S. Thomas, of Fulham, and Mr. W. E. Tilley, of Kirby-street, for an improved process for plating or coating lead, &c. with aluminium, tin, and other substances, by help of the galvanic battery. Could they not easily coat the interior of leaden water-pipes, as well as cisterns, by means of such a process, and so put an end to the poisoning of water by lead? Aluminium ought to make an excellent coating for such a purpose, and thus applied, might perhaps do as well as if the pipe were altogether composed of it. The coating of insoluble sulphates with which nature itself often remedies this its own evil, is itself suggestive, and perhaps some other modes of coating the interior of leaden water-pipes artificially and systematically might be based on this natural process.

The most hopeful and efficient remedy, however, now practically available, appears to be that provided under a patent secured by Mr. E. K. Davis, of Lambeth, for the coating (amongst other processes) of the interior of leaden water-pipes with a thin film or inner tube of tin, or of compositions of gum-lacs and india-rubber or gutta-percha, in a soft or fluid state, by means of improvements in the usual machinery for making leaden pipes themselves. The coating appears (in pieces of the various tubes which we have purposely examined) to be perfectly adherent, of quite sufficient thickness, and otherwise efficient in its formation for the purpose in view.

The mechanism by means of which these and other processes are effected is ingenious, and the patent of Mr. Davis comprehends various improvements, such as a double-action hydraulic press, the casing of soft metal pipes with block tin and other metals, the forcing of soft metals by compressed air, the plating of sheets in a way described, the making of dies for coating lead and other pipes with other metals, a mode of making still-worms, the coating of soft metal pipes with gutta-percha, india-rubber, &c. and various other improvements. It is with special reference to a remedy for the contamination of water by lead that we have examined the pipes coated under this patent, and we think it well deserves the public patronage, as tending towards the realization of that very desirable end.

CHURCH-BUILDING NEWS.

Croydon.—A site of land at Southbridge, and funds for the erection of another church, have been given, the one by a parishioner, and the other by a clerical non-parishioner; the result of which will be that a commodious structure will shortly be erected, in a locality greatly in need of spiritual instruction. The poor will be especially cared for in the provision made in the sittings. The contracts are already out for the erection of the edifice.

Brede (Sussex).—Broad Oak Wesleyan Methodist Chapel being too small to accommodate the increasing number of Wesleyan Methodists in this neighbourhood, the brothers Coleman, of Chitcomb Farm, have devoted a considerable sum to enlarge and rebuild the chapel, which is now done. Messrs. Crisford and Son were the builders. It was opened for Divine service on the 6th inst.

Kingston.—Last Tuesday, during the alterations now being made in the restoration of Kingston Church, by Mr. White, of Taunton, the Rev. Eccles John Carter, the rector, discovered a long-hidden Early English window, in the western end of the north aisle. The rev. gentleman was so pleased with his discovery, that, according to the *Taunton Courier*, he generously offered to restore the window to its original state at his own cost.

St. Hilary and Truro (Cornwall).—The Bishop of Exeter was to visit the west of Cornwall in the latter part of the present month, for the purpose of consecrating the church of St. Hilary, rebuilt after its destruction by fire, and the new district church of St. George's, Truro.

Shrewsbury.—On Friday before last the first stone was laid of a parsonage at Shelton, near this town. The ground, within a few yards of the Shelton turnpike gate, and in sight of the renowned oak, was given by Mr. Robert Burton, of Longner-hall.

Ilkeston.—The restoration and enlargement of the parish church has proceeded so far that October 18 is fixed for the opening. At present the sum of 600*l.* is wanting; and owing to the laudable desire of the committee to render the building every way worthy of its purpose, 300*l.* more will have to be expended on the tower.

Nottingham.—The chapel recently erected in connection with the General Hospital of this town was formally opened on Thursday before last. The chapel is erected on the space formerly vacant intervening between the west end of the main building and the fever wards. The gable ends point north and south, the latter projecting considerably beyond the front of the main building. It is approached from the centre gallery, the entrance doors being at the north-east and north-west corners of the edifice. The length is 54½ feet, and breadth 19½ feet, with a highly pitched roof. Both internally and externally the appearance of the chapel, says the *Notts Guardian*, is sufficient to indicate its character, and yet it harmonizes with the general architecture of the building. The interior arrangements are devoid of ornamentation. The low open benches are all arranged due east and west, with an aisle running along the centre of the room, and provide accommodation for about 100 persons.

Bangor.—The first stone of a new English Congregational chapel here was laid on 28th ult. The building will afford accommodation for 400 persons on the ground-floor, with a provision for a gallery. The architect, who is likewise superintending the work, is Mr. George Northcroft; the builder, Mr. John Barry, both of Bangor. The style is early English. Cost, including land, 1,100*l.*

Otley.—The Independent Chapel here is in course of enlargement, and is so arranged by the architect, Mr. Shaw, of Leeds, that two class-rooms under the new wing of the chapel will communicate with the school, and can be thrown open when required for large meetings, &c. A vestry is also provided. The gallery will contain a new organ, now building by Messrs. Forster and Andrews, of Hull, and will also give accommodation to the scholars during Divine worship.

Burley.—A monument has been recently erected in the south transept of St. Matthias's Church, Burley, near Leeds, to the memory of the late Mrs. Smith, wife of Mr. John Smith, of Burley House, banker. The monument is a piece of sculpture by Mr. Benjamin Spence, pupil of Mr. Gibson, and it was executed in Rome, from whence the sculptor has lately returned. The design, in mezzo-relievo, represents an angel bearing the spirit of the deceased to heaven. It is executed in white marble, and is inserted in a carved tabernacle or niche, in Sicilian marble, with crocketed canopy and enriched buttresses, of the Decorated style, in conformity with the architecture of the building. The deceased lady had taken a deep interest in the erection of the church, which she did not live to see completed.

Spofforth.—On Tuesday before last, the parish church of Spofforth was re-opened by the Bishop of Ripon. It had fallen into a state of dilapidation and decay, and has been restored, according to the original design, under the superintendence of Mr. J. W. Hugall, of Cheltenham, architect. Col. Wyndham, the principal proprietor in the parish, encouraged the undertaking at the commencement by a subscription of 300*l.*; the farmers and inhabitants consented to a rate of 500*l.* besides subscribing liberally; and the rector, the Rev. J. Tripp, made himself responsible for nearly 500*l.* But as the cost amounts to upwards of 2,160*l.* and the various contributions to not more than 1,860*l.* there still remains a debt of about 300*l.* Mr. G. Roberts, of Clifford, was the contractor for the works. The style adopted or rather followed by the architect, is Norman, the principal features of the old church being of that period. Owing to the dangerous condition of the south arcade, it has been rebuilt, but the north one remains as originally erected. The two aisles were in a ruinous condition, and consequently taken down. The walls of these aisles, as well as those of the chancel, had no foundations, and it is a matter for surprise how they remained standing so long. The fabric now consists of a perpendicular tower, with a western door and three-light window above, and a very lofty arch opening into the nave. The floor has been appropriated as a vestry, an oak screen having been fixed in the archway. The nave, and north and south aisles, porch, and chancel, are of Norman character. The Norman south doorway has been restored. A font of Caen stone is placed at the west end of the south aisle, on a pavement of Minton's encaustic tiles. The nave and aisles are seated with low benches of stained deal, but doors have been

added to them. The pulpit is of Caen stone, carved and buttressed at the angles. The chancel is approached by three steps: at the rails are other three, and the altar stands upon a pace paved with Minton's tiles. A double sedilia is provided in the south wall: oak rails upon carved pillars cross the chancel. The ancient stone altar has been restored. Three stained glass windows, the offerings of Mr. Mrs. and Miss Faviell, of Stockeld-park, occupy the east wall; they contain representations of the Crucifixion of Our Lord, with Abraham's offering of his Son beneath; the Resurrection, and Jonah's release from the Whale; and in the centre window the Ascension, with the taking of Elijah into Heaven. There is an arcaded reredos, with interlaced arches of stone. All the roofs are of stained deal, boarded and open. A hot-water apparatus has been put down.

ST. JAMES'S PARK.

SIR B. HALL has announced his intention of not proceeding with the proposed road through the enclosure until the project has been considered by Parliament.

In Sir B. Hall's letter respecting the proposed new road through St. James's-park, he lays stress on the desirableness of relieving the traffic for carriages along Parliament-street. Would not this end be attained by opening a carriage-road from Trafalgar-square, at Spring-gardens' corner (where now exists a passage for pedestrians only), and so on to Storey's-gate? This would require the removal of a few houses certainly, but not so many as would be necessary were the park bisected. A READER.

Another writer, "A Londoner," points out that by taking off a small piece of the garden of St. James's Palace, a safe and good way from the park to Pall-mall may be obtained by the existing road, past the end of the German Chapel. "If a foot suspension-bridge be thrown across the water," he adds, "I think it would be a boon to the public, but a carriage-road is an insult to botany and good sense."

NEW FORMULA FOR CAST-IRON BEAMS.

MR. FAIRBAIRN, in his recent work on cast and wrought iron, states that, for bridges, warehouses, &c. cast-iron beams should not be loaded with more than one-fifth or one-sixth of the breaking weight. I beg to send you a simple formula of my own, which will give the safe load in cwts. equally distributed at one-fifth the breaking weight. It is derived from Mr. Hodgkinson's formula for the breaking weight in tons in the middle:—

$$W = \frac{26\,a\,d}{l}$$

where W = breaking weight in tons.
a = area of bottom flange in inches.
d = depth of beam in inches.
l = length between supports in inches.

The new formula is—

$$S = \tfrac{2}{3}\,\frac{26\,a\,d}{L}$$

where S = safe load equally distributed in cwts.
a = area of bottom flange in inches.
d = depth of beam in inches.
L = length between supports in feet.

The beams are supposed to be of Mr. Hodgkinson's section of greatest strength, the flanges being in the proportion of 6 to 1.

ROBT. H. SKAIFE.

FORGING AND WELDING IRON.—An invention has been patented by a Mr. Bertram, to cause the sheets of iron used in forming steam-boilers, or in iron ship and bridge building, &c. to be suitably formed at the edges to allow them to be welded together. It is not essential to thicken or give any particular form to the edges of the sheets of metal, as they may be welded together by overlapping their edges, or otherwise; and where ribs have been heretofore used, the sheets of iron are to be forged or rolled with ribs thereon, to admit the edges of one sheet being welded to those of another sheet, either longitudinally or transversely.

A NEW PAINT.

THROUGH the medium of your widely-circulating columns, I beg to call the attention of the building world in general, and your correspondent "T. W." in particular, to the results of some experiments I have lately made, with the view of discovering a "*wash*," or "*paint*," more durable than the "lime-wash," so often complained of, and at the same time cheaper than the "oil-paint" in ordinary use. This object, I think, I have fully attained.

The first method I will introduce to your notice, consists in boiling together for half an hour,

Commercial "Shell-lac,"	1	lb.
Ditto "Borax" (Tincal)...	1½	„
And water.....	10 = 1	imp. gall.

allowing the solution to stand until *quite cold*, and then straining through bags of some strong coarse material: the solution, thus prepared, should be mixed with from 6 lbs. to 8 lbs. of finely-ground *dry* "*white lead*,"* and raised once more to the boiling point, with *constant agitation*. When cool, it may be stowed away in casks, or carboys (or any description of vessel which will *perfectly* exclude the air), and will be fit for use at any time, with the simple preparation of *stirring it well up*.

This paint laid on stone, brick, stucco, or wood, in the usual manner, will dry in from thirty minutes to two hours, according to the density or porosity of the material, so that a day would be more than sufficient time for the "laying on" and drying of several coats: it possesses a mellow pinkish-white colour, very agreeable to the eye, produced by the combination of the "dead-white" of the lead, with the brownish-red dye contained in the crude shell-lac. Of course, different tints can be communicated to the paint by using various kinds of shell-lac, and the admixture of small quantities of "*ochre*," "*sienna*," &c.

The same menstruum is obviously available for other colours, for internal decorations, and for every purpose will be found to possess many advantages. Its *cost* is less than half that of the composition generally employed, being (at the most) about 2s. 6d. per gallon. When first laid on it has a tendency to come off when rubbed, but a few showers of rain will put a stop to this disadvantage.

Of its durability at present I can say very little, sufficient time not having elapsed; but I do know, that a stream of boiling water directed upon a wall three hours after it had been painted (with two coats) by the preceding process, had no effect whatever; and I feel certain, that an after coat of the solution of silicate of potash and soda I recommended in the *Builder* a few weeks since, for the cure of "salt in walls" (*carefully filtered*), would render my new paint *quite permanent*.

The name I have given it is "THE LACBORACIC PAINT."

The same solution (of borax and shell-lac) used for the paint, renders hydraulic cement, plaster, &c. more durable, if the former is employed as the moistening agent. The second method of painting that I have found successful is this:—The colour is to be mixed with a solution of glue (about a *pound*, dissolved in a gallon of water), and the house or wall to be painted with the same: when nearly dry, it must be brushed over with a strong infusion of *oak-bark*, or *catechu*. As will be readily seen, the *rationale* of this is,—the *gelatine* (*glue*) is converted into *leather* (tannate of gelatine) by the *tannic acid* of the oak-bark, and thus protects the colour from sun and rain. If the oak-bark infusion is applied while the coat of glue and colour is too wet, the result will be a very unequal surface: if, on the other hand, *too much* time is allowed to pass, the action of the tannic acid takes place with greater difficulty, and the paint is not likely to be so durable.

Both of these may with great propriety be denominated "*sanitary paints*," and they are, I believe, superior (at least, with regard to cheapness) to those of Mr. Moreton, of that name: the *first* I myself prefer, as the other is more trouble, and requires delicate manipulation. The only rule necessary for *Lacboracic* painting is, *give the paint a stir every time you put your brush into it*.

I should have mentioned before that the residue of crystallized borax and undissolved shell-lac left in the straining-bag, if boiled again in a small quantity of water, may be treated and made use of in the same way as the former solution.

I have been strongly advised to patent these original processes; but having already an invention more in accordance with the spirit of the times, viz. my "Volcanic Shell," now before the Ordnance, for the benefit of the Russians, and being of the "no monopoly" school, I deem it better to present them to the *Builder* as an earnest of my good will.

In a late impression of your journal I see "Chemicus" says that he will "solve the mystery," &c. "but without soap." In my opinion, he has done your quick penetration of the previous week great injustice, for your remark is verified—it *is* soap. I conclude that it does not much matter whether *soap* is added ready made, or whether it is manufactured with the paint. "Chemicus" (?) does not appear to be aware that when a fixed oil, or fat, and an alkali, alkaline earth, or even *heavy metallic oxide*, come in contact, with at the same time a slight elevation of temperature, they combine to form *soap* in the two first cases, and in the third, what are generally called "plasters:" consequently, "Chemicus's" composition contains no soap—till he makes it! The lime-soap contained in it is a mixture of (allow me to inform him) stearate of lime, margarate of lime, and oleate of lime—the lime-salts of three fatty acids, in fact,—a perfect *soap*. Why, even if the tallow candle from the forehead of a miner, and the lump of *clay* into which it is stuck, were boiled together, a true soap would result, —an alumina-soap. I hope you will do yourself justice on this point, by administering a "*lathering*" to the gentleman whose signature appears to be of such doubtful propriety.

WENTWORTH L. SCOTT.

Clay colours are *the* best for the *Lacboracic Paint*.

* Or "*White Zinc*," or any other good "*white*," in an equivalent quantity.

STAINED GLASS.

Lincoln Cathedral.—The scaffolding was removed from the new stained-glass window at the east end of this cathedral on Thursday in last week, and it was at once exposed to view. The mosaic work, executed by Mr. Pickett, in 1762, having been considered not to be in accordance with the architectural character or elaborate richness of the choir, a subscription was raised for the purpose of replacing it by a more suitable design, and a committee appointed to effect this object. The nature of the stonework, the character of the principal remains of painted glass in the cathedral, and the limited sum at their disposal, imposed on the committee the necessity of following the precedent supplied by those designs of the thirteenth century, which consist of an assemblage of small pictures in panels, symmetrically arranged on an ornamental ground. And it having appeared that a design setting forth the scheme of Human Redemption would be most appropriate to the conspicuous situation of an east window, the present design, after much consideration, was adopted. The groundwork, as it were, consists of an ornamental design, the principal features of which are represented in various colours on a white ground, and which serves as a setting to the medallion pictures embedded in it. These medallions occupy the centres of the principal tracery lights, and are arranged in the lower lights in a peculiar order, twenty-eight circular panels being placed in the form of a cross, up the centre, and across the window, whilst twenty others, of equal size, but of different shape, form a kind of square about the cross, the spaces between the square and the cross being occupied by sixteen smaller panels. In the panels composing the square are represented the Fall of Man and its result, the Expulsion of our First Parents from Paradise, as well as those early and significant types of the Great Sacrifice, Cain and Abel's Offering, Noah and Job's Sacrifice, and the Offering of Isaac by Abraham. Then comes the Jewish Dispensation, shown by the delivery of the law to Moses, and the sacrifices appointed under it, the Paschal Lamb, and the setting free of the Scape Goat, &c. The representation of this last type occupies six medallions. Other types are introduced, indicative of our Lord's death and its spiritual effects, as the lifting up of the Brazen Serpant, Jonah and the Whale, Moses striking the Rock, the Gathering of Manna, the Passage of the Red Sea, and Entry into

the Promised Land. In the panels composing the Cross are represented scenes from our Saviour's life, illustrative of His Divine Mission. In the lower limb of the Cross are the Annunciation, the Adoration of the Magi, the Baptism of Christ, His Temptation, Transfiguration, and Triumphal Entry; and in and about the centre are,—the Last Supper, the Agony in the Garden, the Scourging, the Arraignments before Caiphas, Herod, and Pilate, the Crucifixion, and the Entombment. The Resurrection and Ascension are placed above the Cross, in the two principal tracery lights of the window. The Cross, however, contains, besides, the Marriage in Cana, Healing the Sick of Palsy, Healing the Lunatic Child, Raising Lazarus, the Widow's Son, and Jairus' Daughter, Healing the Blind, the Ten Lepers, the Angel appearing to the Marys, the appearing to Mary Magdalene, to the Disciples at Emmaus, to St. Peter, and to St. Thomas. In the smaller panels are represented the Sixteen Prophets, the harbingers of Christ. The emblems of the Evangelists are introduced in the smaller tracery lights, in additional allusion to the Christian Dispensation. In the centre of the large circle crowning the window is represented our Lord in Glory, surrounded by angels. Thus, the doctrine of the Atonement is set forth in one view. Messrs. Ward and Hughes were the artists employed. The groups are executed on the principle of bas-relief, the figures being cut out and insulated by the ground of the panel, and rendered rotund and distinct by strong shadows.

Gloucester Cathedral.—A memorial to the late Dr. Thomas Evans, head master of the Cathedral School, has just been completed in the Cloisters. It consists of a painted glass window, with brass plates, let into the stonework underneath, on which are inscriptions. The window forms part of a scheme, originated by the Rev. Dr. Jeune, for the restoration of the Cloisters, one object of which is for the future to avoid defacing the Cathedral by unsightly monuments, such as have hitherto been fixed to the walls, and whilst affording every assistance to those who wish to erect memorials to their friends, to add to the decoration of the building and the restoration of the fabric itself. The proposal was,—to fill the whole of the Cloisters with painted glass, according to a plan decided on, which will form, when completed, a history of the Annunciation, Nativity, Crucifixion, and Resurrection of our Saviour, the whole divided into a series of subjects connected with the life of our Lord, any one of which may be selected by the parties erecting a memorial window, but for obvious reasons, the compartment to which a certain subject is assigned cannot be altered. The stonework of the window to be restored by those putting up the memorial, the chapter in such cases dispensing with the fees. It is found that the whole cost of each compartment will not exceed 200*l.* including restoration of stonework, painted glass, and brasses, a sum, as the local *Chronicle* remarks, not much more than the fees alone for the erection of a tolerable monument in the Cathedral. The painted glass and brasses, forming the memorial of Dr. Evans, are the work of Messrs. Hardman, of Birmingham. The glass represents in the eight upper lights of the window the journey of the Holy Family, Joseph and Mary seeking for Jesus, and finding Him in the Temple. The lower lights being too close to the eye for figures, are filled with flowered quarries and an enriched border. The brasses are inscribed with black letters, with illuminated capitals and scrolls. Other windows are contemplated in continuation of the series. To further decorate the Cloisters, we may here observe, the chapter have decided on allowing brasses and encaustic tiles to be laid on the floor, dispensing in this case also with the usual fees. The expense of encaustic tiles for one compartment, it is said, will not exceed 20*l.*: the cost of brasses will, of course, depend on the amount of work in them, ranging, it appears, from 10*l.* upwards. Five of the compartments immediately adjoining the Deanery, have been lately restored by the dean.

Doncaster Parish Church.—A memorial in stained glass is to be placed, by Mrs. Saunders, in the window of the west end facing the south aisle in the parish church of Doncaster, now building. The artist employed is Mr. J. B. Gaproniré, of Brussels, who designed some works of art for the Brussels Cathedral.

Gateshead Parish Church.—The Fire memorial window, by Mr. Wailes, has been erected in the chancel of St. Mary's Church, Gateshead, which was to be re-opened on Sunday last. The window has five lights. The centre light is occupied by a figure of our Saviour. On His right are the evangelists Matthew and Mark; and on His left, Luke and John. The three larger medallions in the tracery are devoted to the Baptism, the Last Supper, and the Resurrection. In the two smaller medallions are inserted the royal arms and the arms of Gateshead. At the fot of the window, under the principal figures, are angels bearing scrolls, and a representation of the falling of the tower of Siloam, together with the inscription commemorating the late fire and explosion, which destroyed so much of Gateshead and Newcastle. It is expected, according to the local *Observer*, that other two memorial windows will shortly be placed in the chancel.

PROCEEDINGS UNDER THE METROPOLITAN BUILDINGS ACT, 7 & 8 VICT. c. 84.

ON the 14th September, the district surveyor of Bermondsey summoned Mr. George Hodges, mason and builder, before Mr. Coombe, the magistrate, at the Southwark Police Court, for having built a one-story building with the external walls 4½ inches in thickness, instead of 8½ inches, as required by the Act; for having built a flue of less internal diameter than 8½ inches, and with the fronts thereof 3 inches in thickness instead of 4 inches; and for having placed certain wooden rafters within 3 inches of the face of such flue, where the substance of the brickwork is less than 8½ inches thick, it being only 3 inches thick as before mentioned. The district surveyor produced the certificate of the official referees, and proved the works to be contrary to the Act in all the particulars before mentioned. The magistrate thereupon ordered Hodges to enter into his own recognizances for abating and taking down the building, and paying 3*l.* 17s. 5d. costs.

Hodges subsequently pulled down the building, but failed to pay the costs. The magistrate, on the 24th of September, issued his warrant to levy the amount of the recognizance (25*l.*) by distress; and inasmuch as the defendant alleged that there was not sufficient to distrain upon, he was committed till the distress should have been levied.

THE WESTFIELD GALLERY, NEAR RYDE.

SIR AUGUSTUS CLIFFORD has lately added a gallery to his marine residence at Westfield, Isle of Wight, overlooking a lawn studded with specimens of sculpture, with a background of luxuriant foliage. The interior is finished with Corinthian pilasters, supporting an enriched cornice, from which springs a segmental ceiling, divided into compartments (corresponding with the divisions formed by the pilasters), and these are again subdivided by coffered panels, supporting a skylight, through which the principal light to the gallery is admitted. The glass in the skylight is of ornamental design, and emblematical of art, literature, and music. The room has a semicircular tribune, with the Apollo Belvidere at the south end, over which is a medallion of Sir Augustus, executed by Mr. Grey, sculptor, of Ryde. The walls are hung with a deep blue paper, diapered with black, divided, by large gold moulding of the cable pattern, into panels, with stiles formed of a gold-coloured paper. The paper is continued round the whole of the tribune, and in the anteroom. The ceiling is in grey and white, relieved by gilding.

The designs were by Mr. Thomas Hellyer, architect, of Ryde, and the building was executed by Messrs. Dashwood, of Ryde.

RAILWAY MATTERS.

The New Central Station at Leeds.—The works for the new station at the Leeds termini of the Great Northern, Lancashire and Yorkshire, and Leeds, Bradford, and Halifax Junction Railways, Wellington-street, Leeds, have been let. The building is to front to the south-east, in a line with the Whitehall-road. The style of architecture of the façade is mixed, the Grecian predominating. The length of frontage will be 243 feet 9 inches, exclusive of a station-master's house at the south end; and its height 20 feet. The main entrance, which will open into a booking-office, 30 feet 6 inches by 22 feet 9 inches, will project from the line of the building 1 foot 6 inches, and the extremities, surmounted by pediments, 9 inches. The frontage is to be constructed of red brick, with stone facings, and rustic pilasters at the entrance and extremities. The interior station will be about 500 feet long, and 137 feet wide, covered in by two spans of iron and glass roofing, supported on metal columns. There will be three platforms, each 130 yards long and 20 feet wide, and six lines of rails. The foot approach from without will be by flights of steps from Wellington-street, and the carriage approach to the main entrance by an incline. The works which are now in progress have been let to Messrs. Kirk and Parry, of Sleaford, Lincolnshire; and the cost is to be about 20,000*l.*

Viaducts.—The viaduct near Wellingborough, in connection with the Hitchin and Leicester Railway, has given way, in consequence of which three of the principal arches will have to be taken down.—— The foundation-stone of the great Rhymney Viaduct has been laid, and the whole will occupy one year in completion. It is to be 750 feet in length, and will span the valley at a height of 120 feet. The whole is to consist of sixteen arches, each 45 feet in span, and to be built of stone and brick, to carry a double line of railway. This undertaking is designed to take the Taff Vale Extension Railway over the Rhymney Valley to a junction with the line now in course of construction from Rhymney to Cardiff. Mr. C. Liddell is chief engineer.——The last girder of the majestic Crumlin viaduct on the Taff Vale Extension of the Hereford, Abergavenny, and Newport Railway, was successfully raised on Saturday amid the rejoicings of the public and the workpeople. Shortly after the girder was fixed a procession was formed, which marched through the village, ascended the Kendon Mountain, then moved on to the viaduct, and on the centre gave three cheers for Mr. Kennard, the contractor, who, with his wife and brothers, was present, three cheers for Mrs. Kennard, and three for their young family.

Traffic Returns.—The returns of railway traffic in the United Kingdom, for the week ending September 15, amounted to 435,154*l.* and for the corresponding week of 1854, to 393,456*l.*; showing an increase of 41,698*l.* The gross receipts of the eight railways having their termini in the metropolis amounted for the week ending as above to 195,211*l.* and for the corresponding week of last year to 172,962*l.*; showing an increase of 22,249*l.* The increase on the Eastern Counties Railway amounted to 1,056*l.*; on the Great Northern, to 2,004*l.*; on the Great Western, to 4,878*l.*; on the London and North-Western, to 5,036*l.*; on the London, Brighton, and South Coast, to 1,723*l.*; on the London and South-Western, to 2,575*l.*; and on the South-Eastern, to 5,081*l.*: total, 22,353*l.*, from which must be deducted 104*l.* decrease on the London and Blackwall, leaving the increase, as above, 22,249*l.*

THE SUPPLY OF "QUANTITIES" BY ARCHITECTS.

PERMIT us to submit a query, which, as opposite opinions prevail upon it in the provinces, should be settled.

What is the practice usually adopted by the profession concerning scheduled quantities of works about to be tendered for?

We arranged with a committee of proprietors to prepare all necessary plans and specifications, &c. and to superintend the works for a number of dwellings for a fixed amount. In doing this, can we, without consulting them, cause the quantities to be got out, inserting in them a per-centage for such trouble? We apprehend we may. And when the tenders are received, have the committee any right to interfere with such per-centage, if reasonable?

In short, can we, at our option, cause quantities to be got out, and receive remuneration for it without consulting the proprietors? SUB.

*** A considerable question is involved here, on which, before making any observations, we shall be glad to receive expressions of opinion.

A LEADING THOROUGHFARE.

YOUR labours to bring about improvements in London have done much good, and as an old resident, I beg leave to thank you for the past, and at the same time to express my hopes that your exertions for the future will be equally successful.

I have witnessed all the improvements during the last forty years, and one of the greatest has been the opening of New Oxford-street, which has contributed so much to facilitate the intercourse of the West-end with the City. I wish to propose a similar opening of another new street, which will cost but little, comparatively speaking.

Take the map of London, and follow the line of Piccadilly, from Hyde-park-corner to its termination in Lincoln's-inn-fields, as the square is called. You will then speedily see how little it would cost to open a way into Holborn. Follow the line still in Holborn for a short distance until you come to Gray's-inn-lane. Trace the line still onward, by Greville-street and Charles-street to the north of Furnival's-inn, and pursue the course across the now vacant hollow, called Victoria-street, until by a straight line you enter West-street, and so into Smithfield. Smithfield being no longer a cattle-market, may be rendered available as a means of safe communication with Finsbury and the adjoining districts, through the several streets leading to Finsbury-square, Finsbury-circus, &c.

It will be necessary to build a viaduct over Victoria-street, which at this moment appears to invite the proposed improvement.

The cost of this line of new street cannot be much, whereas the advantages it will afford to the inhabitants of this metropolis are above calculation. It will lessen the dangers of the crowded vehicles in Cheapside, Newgate-street, Ludgate-hill, Fleet-street, and the Strand, and it will save the poor horses while dragging heavily-laden omnibuses from many falls on Ludgate-hill, and above all, on Holborn and Snow hills. ENNA.

SHORTENING SPOFFORTH CHURCH.

ON Tuesday, the 18th, Spofforth Church, near Wetherby, Yorkshire, was reopened by the bishop of the diocese, after undergoing a restoration. The architectural merits of the present structure I will leave for others to criticise; but there is one thing connected with it which I cannot pass by quietly. I refer to the shortening of the chancel by one-third, which has unfortunately been done by the rector, and by which I feel sure that the promoters of the scheme have lost more subscriptions than they have any idea of. But how comes it that this plan was allowed? For it could not be done without the sanction of the Ecclesiastical Court. Therefore, application was made, during last year, for leave; and, as no one interested himself sufficiently in the welfare of the church to oppose it, after postponement of their decision for some six weeks, with much perseverance against many difficulties on the part of the applicants, leave was at length reluctantly given, and one of the finest chancels about deliberately spoiled. But what is the good of the Yorkshire Architectural Society, if its members cannot keep an eye on the old architectural beauties of that land of abbeys and churches they are proud to call themselves after? They may say that it was not their place to interfere,—but the question is, whose is it? and, surely those lovers of architecture who have joined themselves into a society are more likely to be able to bear the expense of law in an architectural cause than any private individual; and the opposition would have much greater weight from a body of so high a standing. Now, however, it is done, and too late to find fault as far as Spofforth is concerned; but may its fate awaken the slumbering lovers of architecture to a stricter vigilance over those works of our ancestors they profess to take a pride in. M. R. F.

AMERICAN PATENTS.

THE following, amongst many other, claims of patent right, recently made in the United States, are quoted from the *Journal of the Franklin Institute of Pennsylvania*:—

For an improvement in the manufacture of artificial stone; Thomas Hodgson, Brooklyn, New York, assignor to Robert L. Wright, city of New York; patented in England, May 9, 1854. Claim: the composition formed by the admixture of sand or pulverized stone, plaster of Paris, and beasts' blood, when mixed in the manner and in about the proportions to be moulded or cast, while in a plastic state, into blocks, architectural ornaments or devices, statuary, or ornamental or other forms or figures, and in such conditions used as a substitute for stone, for building, architectural, or other ornamental purposes.

For an improvement in plank roofs for building; Samuel Taylor, Petersham, Massachusetts. Claim: making each of the boards of a saddle form, in order that when laid together their contiguous plane surfaces may not only be in close contact, but be so inclined as to prevent water from remaining between them and causing or promoting their decay. Also, the improvement of providing each of the grooves of the upper boards with an inverted metallic or water-tight lining or trough.

For an improvement in wrought-iron beams and girders; Anthony Pollak, Philadelphia, Pennsylvania. Claim: the combination in wrought or malleable iron beams or girders of top and bottom T pieces, with flat or plane surfaced longitudinal plates riveted upon both sides of the stems or vertical portions thereof.

For an improvement in scaffolds; Abram C. Funston, Philadelphia, Pa. Claim: making the back upright of one or all of the sections or frames forming this particular scaffold in two parts, and providing the lower part with a slot, and uniting it to the upper part by a set screw, which plays in the slot, and allows of the lower part being raised.

For an improved arrangement of drains for sewers; P. J. Coogan, Charleston, S.C. Claim: the employment of siphons placed within a box or receiver, whereby the sewer or channel which extends from the box or receiver to the main sewer, is prevented from being choked or stopped with sediment or impurities, and all unpleasant and unwholesome effluvia arising therefrom, avoided. Also, the box or receiver provided with siphons. [This is either an authorised appropriation of an Irish invention, or an unauthorised appropriation of it. Coogan calls it his invention, which it is not.]

For a machine for cutting cavities, spherical, ellipsoidal, &c.; Isaac B. Hartwell, Woodstock, Vermont. Claim: 1st, the spherical shell or cutter turning at the same time on the axis of the sphere of which the shell is a part, so as to cut a spherical groove or a convex and concave surface of less extent than a quadrant of the superficies of a sphere, yet corresponding in shape to the convex surface of a spherical section formed by two planes passing through the sphere at right angles. 2nd, the method of giving a compound motion to the spherical shell or cutter, by means of the tight gear wheel and the loose gear wheel revolving on the axis of the rocking-frame, so as to be in connexion with the pinion in all necessary positions of the rocking-frame. 3rd, the use of circular saws set in an oblique sliding-frame, in connexion with the spherical cutter, for the purpose of cutting straight grooves to connect with the spherical grooves at each end of the block of wood.

Miscellanea.

IRON STILL SUPERSEDING WOODWORK IN NAVAL ARCHITECTURE.—Some novelties are observable in the fitting out of the Australian Black Ball ship *Schomberg*, says the *Liverpool Times*. Her 'tween decks are fitted up with iron berths throughout. Her iron tanks are fit to carry either water or provisions, and, while able to bear any weight upon them, act as permanent ballast. The foreyard of the vessel is a hollow iron tube, made of quarter-inch plates. It is 96 feet in length, 23 inches circumference at the slings; greatest circumference, 6½ feet. It weighs 4 tons—a wooden spar same size would weigh 8½ tons. The first cost is a little more than wood. Messrs. Baines and Co. for whom this iron foreyard was made by Messrs. Wainwright, intend, according to the *Liverpool Journal*, to spar every ship they own with tubular iron spars.

APPARATUS FOR RAISING SUNKEN VESSELS.—An exhibition has been made by Mr. Samuel Rainbird, in Great Yarmouth, of a working model of valuable apparatus for raising sunken vessels, which has just been perfected by Mr. Rainbird, and is now patented by him, in the hope that he may be enabled to bring out his invention. The experiments are said to have been satisfactory.

ALLEGED JOBBERY IN IRELAND. — The Irish Board of Works are charged by the *Cork Examiner* with a long string of blunders and jobbery, especially in regard to the contract for a new Lunatic Asylum for Cork. The governors had consented to an expenditure of 50,000*l.* proposed by the Government authorities as the requisite cost. The Board of Works thereupon took the matter in hand, and entered into contracts which at present amount, it is said, to 85,828*l.* odds, besides 2,000*l.* additional expended in preventing the rain from coming in on the heads of the governors in torrents, and in removing dry rot from the joists and flooring. As for the ventilation, it is declared to be a dead failure, the water supply and drainage defective, pumps choked, patients' recreative-yards facing the north, and these but a specimen of "a shameful catalogue of blunders," an "unhappy site" inclusive.

WHITECHAPEL WORKHOUSE COMPETITION.—In a late number there was an advertisement, "To Architects," for an offer to compete for making plans, &c. for the guardians of the above workhouse, thereby putting the profession to a sort of public auction, so as not to pay according to the professional usage, but at the lowest price. I do hope that you will be enabled to shame every professional gentleman claiming respectability from making any offer. Allow me to add, I applied to the clerk of the said guardians for information, but he refused to answer a written communication.—ALPHA.

MINING COLLEGE FOR NEWCASTLE-UPON-TYNE.—It is proposed to erect a building for a Scientific and Practical Mining College at Newcastle-upon-Tyne. Plans have been executed by Mr. A. M. Dunn, of Newcastle, architect, and prospectuses issued in accordance with views brought under the notice of coalowners in all parts of the kingdom by the president of the Northern Institute

STATUE OF AN ARCHÆOLOGIST.—A colossal statue of the celebrated archæologist, Count Carlo Castiglione, has just been inaugurated in the court of the Palazzo Brera, at Milan.

THE SHORT TIME QUESTION.—I shall be glad to know if there is any stated time that a man should work *during the week, to entitle him to the 1½ hour on Saturday*. It appears to me that when the four o'clock system was adopted, this question was never settled.—H. C. W.

*** The custom is to pay the full time, even if men come to work on the Saturday.

PARISIAN BUILDING TENDERS.—On the 3rd of next month tenders will be received at the Hôtel de Ville, for the construction, on the Place de l'Hôtel, of a building destined to receive the Caisse de Poissy. The plans of this building, the cost of which is estimated at 627,043f. are by M. Baltard, the city architect.—*Galignani*.

SALE OF A PARISH.—The whole of the parish of Exbury, in Hampshire, is to be sold. It belongs to the Mitford family. The parish consists of 2,400 acres, a mansion-house, half-a-dozen farms, two public-houses, a village, and about fifty cottages. It is bounded by the New Forest, Beaulieu River, and the Solent Sea.

BRIGHTON AND SUSSEX SOCIETY OF ARTS.—After an interval of two years, Brighton again boasts a gallery of arts, composed, in the main, of the works of local contributors. The site of the exhibition is the kitchen of the Pavilion, which, lighted from the sky, is said to be well adapted for the display of paintings.

DISTILLATION OF COAL.—Messrs. Evans, of the Gas-works, Horseferry-road, have recently patented the coating of retorts internally with enamel or glaze, to prevent the gas from escaping through the pores of the material of which the retort is composed, and also, by presenting a smooth surface, to prevent the carbon from adhering. The patentees further claim the glazing of the surfaces of iron or metal retorts, and the application of such retorts to the manufacture of gas for illumination, or to the distillation of coal or other resinous substances.

TENDERS

For rebuilding the Jews' Hospital, with outbuilding, Mile-end-road. Messrs. Tillett and Chamberlain, architects. Quantities supplied:—

Brass and Son	£13,873 0 0
Ashby and Sons	13,488 0 0
Patrick and Son	13,350 0 0
Haynes and Eyre	13,199 0 0
Piper and Son	12,950 0 0
Myers	12,923 0 0
Rider	12,386 0 0
Holland	12,369 0 0
Brown and Co.	11,997 0 0
Hill (accepted)	11,864 0 0

For erecting new warehouses in New Bridge-street, Blackfriars, for Messrs. Spicer. Mr. Sydney Smirke, architect. Quantities supplied:—

Piper and Sons	£8,775 0 0
Haward and Nixon	8,764 0 0
Kelk	8,649 0 0
Lee and Son	8,473 0 0
Holland	8,097 0 0
Cubitt	7,875 0 0
Lucas, Brothers	7,728 0 0
Lawrence and Sons	7,440 0 0
Hubert (accepted)	7,022 0 0

For erecting a house and warehouse, No. 36, Cannon-street West, for Mr. William Edwards. Mr. Horace Jones, architect. Quantities supplied by Mr. Reddall:—

Gammon	£1,791 0 0
Willson	1,786 0 0
Mansfield and Son	1,777 0 0
Ashby and Sons	1,698 0 0
Piper and Son	1,698 0 0
Ashby and Homer	1,687 0 0
Lawrence and Sons	1,674 0 0
Scott and Cornwall	1,572 0 0

For the City Bank, Threadneedle-street. Messrs. W. and A. Moseley, architects. Quantities supplied:—

	Building.	Add if Stone Front.
Haward and Nixon	£22,487	£780
Piper	21,870	1,000
Jay	21,700	938
Cubitt	21,418	983
Lawrence	20,356	908
Kelk	19,977	1,179
Heath	19,970	779
Lucas, Brothers	19,902	880
Myers	19,585	762
Ashby and Son	18,890	914

For villa and stables, Callow-hill, Virginia Water, for Mr. W. Mortimore. Mr. T. C. Clarke, architect:—

	House.	Stables.	Total.
Wyatt	£4,140	840	£4,980
Ashby and Sons	3,574	690	4,264
Loe and Sons	3,578	658	4,238
Browne and Co.	3,460	678	4,138
Gammon	3,425	695	4,120
Lawrence and Sons	3,337	650	3,987
Mills	3,247	649	3,896
Oades and Son	3,165	628	3,793

TO CORRESPONDENTS.

"W. R. S."—"T. R."—"J. R. C. T."—"F. W."—"W. L. S."—"W. D."—"Mr S."—(next week).—"Sir A. C."—"T. N."—"H. C. B."—"W. R."—"W.' (will appear).—"R. L. S."—"S. H"—"A. K."—"R. D."—"N. G." (declined with thanks).—"F. W.'—"Mr. R."—"J. W. H."—"N. E. S."—"J. B."—"W. C."—"W. H."—"H. W."—"T. P. M."

"*Books and Addresses.*"—We are forced to decline pointing out books or finding addresses.

NOTICE.—All communications respecting *advertisements* should be addressed to the "Publisher," and not to the "Editor;" all other communications should be addressed to the EDITOR, and not to the Publisher.